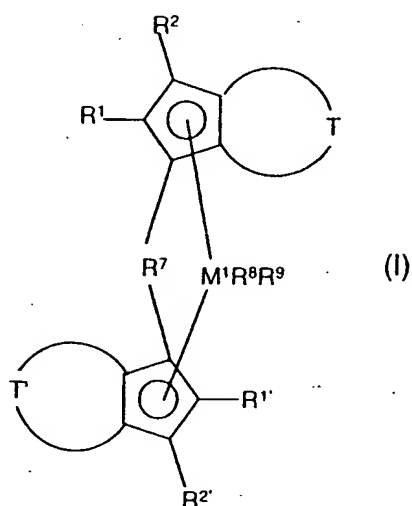
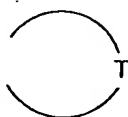


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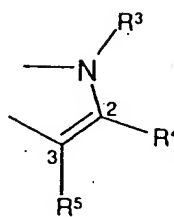
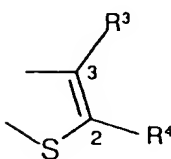
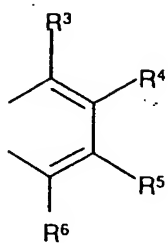
- (original) A transition metal compound of the formula (I)



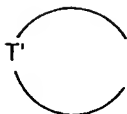
where



is a divalent group such as

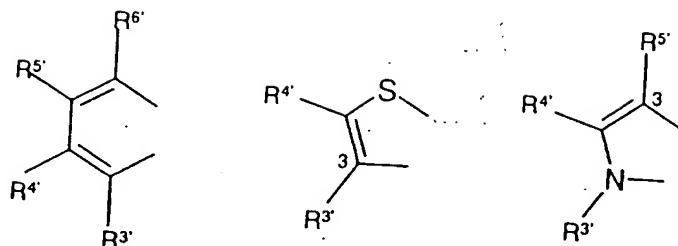


and



is a divalent group such as

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and

$M^1$  is titanium, zirconium or hafnium;

$R^1, R^2$  are identical or different and are each a  $C_1-C_{20}$  group;

$R^1, R^2$  are identical or different, identical to or different from  $R^1$  or  $R^2$  and are each hydrogen or a  $C_1-C_{20}$  group;

$R^3$  is a  $C_6-C_{18}$ -aryl group or  $C_4-C_{18}$ -heteroaryl; or a fluorinated  $C_6-C_{20}$ -aryl or  $C_7-C_{20}$ -alkylaryl, where the aryl part of these groups may bear one or more linear or branched  $C_1-C_{18}$ -alkyl,  $C_1-C_{18}$ -alkoxy,  $C_2-C_{10}$ -alkenyl or  $C_3-C_{15}$ -alkylalkenyl groups as substituents, or  $R^3$  together with  $R^4$  forms a monocyclic or polycyclic ring system which may be substituted;

$R^3$  is hydrogen or a  $C_1-C_{40}$  group or  $R^3$  together with  $R^4$  forms a monocyclic or polycyclic ring system which may in turn be substituted;

$R^4, R^4$  are identical or different and are each hydrogen or a  $C_1-C_{20}$  group;

$R^5, R^5, R^6, R^6$  are identical or different and are each hydrogen or a  $C_1-C_{20}$  group;

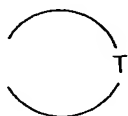
$R^7$  is a bridging structural element between the two indenyl radicals and is selected from the  $M^2R^{10}R^{11}$  group, where  $M^2$  is silicon, germanium, tin or carbon and  $R^{10}$

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and  $R^{11}$  may be identical or different and are each hydrogen or a  $C_1$ - $C_{20}$ -hydrocarbon-containing group;

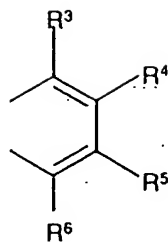
$R^8, R^9$  may be identical or different and are each halogen, linear or branched  $C_1$ - $C_{20}$ -alkyl, substituted or unsubstituted phenoxide, or  $R^8$  and  $R^9$  are joined to one another and form a monocyclic or polycyclic ring system which may in turn be substituted.

2. (original) A transition metal compound as claimed in claim 1, wherein

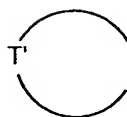


is

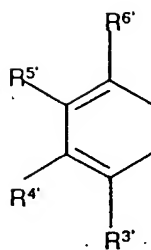
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and



is



where the substituents  $R^3$  to  $R^6$  and  $R^{3'}$  to  $R^{6'}$  are defined as for formula (I).

3. (currently amended) A transition metal compound as claimed in claim 1 or 2, wherein

$M^1$  is zirconium

$R^1, R^2$  are identical or different and are each a  $C_1$ - $C_{12}$ -alkyl group;

$R^1, R^2$  are identical or different and are each hydrogen, methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, tert-butyl, cyclopentyl or cyclohexyl;

$R^3, R^{3'}$  are identical or different and are each a  $C_6$ - $C_{18}$ -aryl group or two radicals

$R^3$  together with  $R^4$  and/or  $R^{3'}$  together with  $R^4$  may form a monocyclic or

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polycyclic ring system which may in turn be substituted, and R<sup>3'</sup> may also be hydrogen;

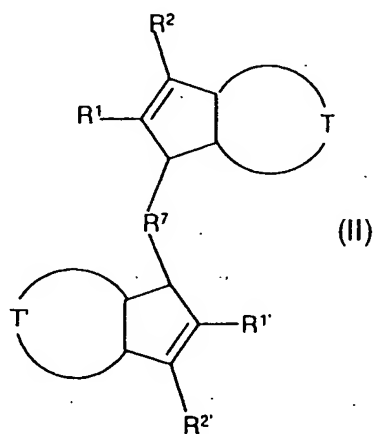
R<sup>4</sup>, R<sup>4'</sup> are identical or different and are either hydrogen or R<sup>4</sup> together with R<sup>3</sup> and/or R<sup>4'</sup> together with R<sup>3'</sup> form a monocyclic or polycyclic ring system;

R<sup>5</sup>, R<sup>5'</sup>, R<sup>6</sup>, R<sup>6'</sup> are identical or different and are each hydrogen, linear or branched C<sub>1</sub>-C<sub>18</sub>-alkyl, C<sub>2</sub>-C<sub>10</sub>-alkenyl or C<sub>3</sub>-C<sub>15</sub>-alkylakenyl; C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>4</sub>-C<sub>18</sub>-heteroaryl, C<sub>7</sub>-C<sub>20</sub>-arylalkyl; or fluorinated C<sub>1</sub>-C<sub>12</sub>-alkyl, C<sub>2</sub>-C<sub>10</sub>-alkenyl, C<sub>6</sub>-C<sub>20</sub>-aryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl;

R<sup>7</sup> is a bridging structural element SiR<sup>10</sup>R<sup>11</sup> and R<sup>10</sup> and R<sup>11</sup> are identical or different and are each a C<sub>1</sub>-C<sub>20</sub>-hydrocarbon-containing group and

R<sup>8</sup>, R<sup>9</sup> are each chlorine or methyl.

4. (original) A ligand system of the formula (II) or its double bond isomers

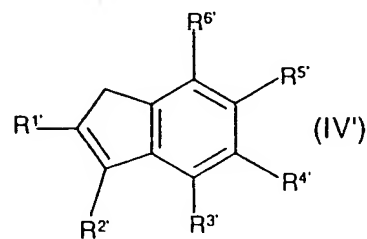
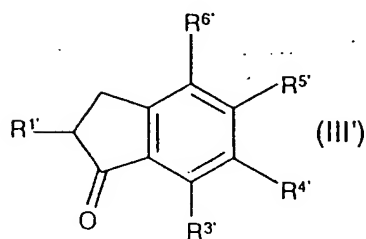
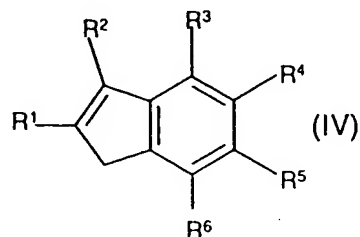
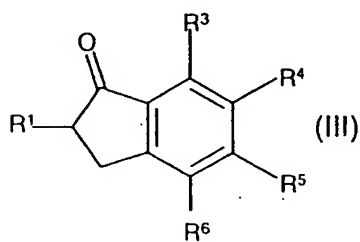


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where the variables are as defined for formula (I).

5. (original) A process for preparing ansa-metallocenes of the formula (I), which comprises the following steps:

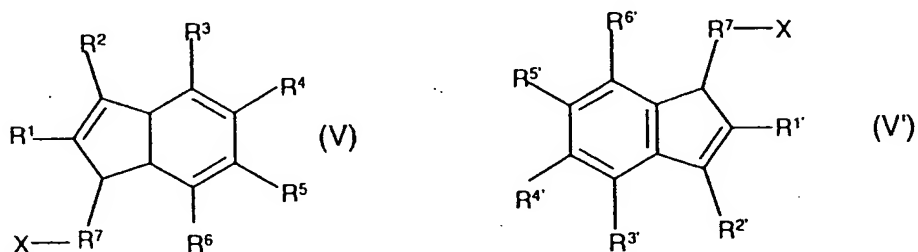
- a) reaction of a 1-indanone of the formula (III) or (III') with an organometallic compound  $M^3R_m^2Hal_n$  or  $M^3R_m^2Hal_n$  and subsequent elimination to form the substituted indene of the formula (IV) or (IV')



where the variables  $R^1$ ,  $R^{1'}$ ,  $R^2$ ,  $R^{2'}$ ,  $R^3$ ,  $R^{3'}$ ,  $R^4$ ,  $R^{4'}$ ,  $R^5$ ,  $R^{5'}$ ,  $R^6$  and  $R^{6'}$  are as defined for formula (I),  $M^3$  is an alkali metal, an alkaline earth metal, aluminum or titanium, Hal is halogen, m is an integer and is equal to or greater than 1 and the sum of m+n corresponds to the valence of  $M^3$ ;

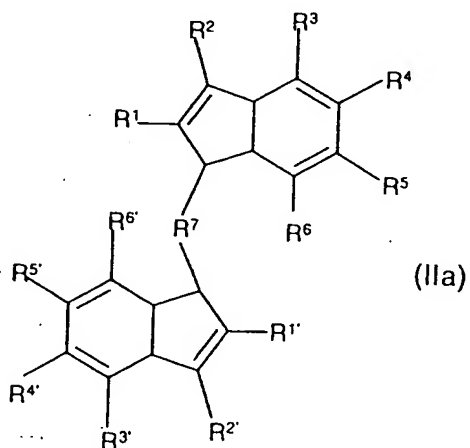
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- b) deprotonation of the substituted indene of the formula (IV) or (IV') and subsequent reaction of the deprotonated indene with compounds of the type  $R^7X_2$  to form compounds of the formula (V) or (V') or their bond isomers,



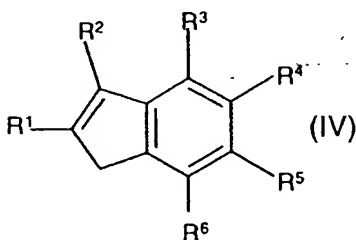
where  $X$  is Cl, Br, I or O-tosyl and  $R^7$  is as defined for formula (I);

- c) reaction of the compound of the formula (V) or (V') with a further deprotonated indene which has been obtained by deprotonation of (IV) or (IV') to form the ligand system of the formula (IIa) or its double bond isomers,



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- d) deprotonation of the ligand system of the formula (IIa) or its double bond isomers and reaction with compounds of the type  $X_2M^1R^8R^9$  to give the ansa-metallocene of the formula (I), where X is as defined for formula (V) and  $M^1$ ,  $R^8$  and  $R^9$  are as defined for formula (I).
6. (original) An idene of the formula (IV) or its double bond isomer,



where

- $R^1, R^2$  are identical or different and are each a  $C_1$ - $C_{20}$  group;
- $R^3$  is a  $C_6$ - $C_{18}$ -aryl group or  $C_4$ - $C_{18}$ -heteroaryl; or a fluorinated  $C_6$ - $C_{20}$ -aryl or  $C_7$ - $C_{20}$ -alkylaryl, where the aryl part of these groups may bear one or more linear or branched  $C_1$ - $C_{18}$ -alkyl,  $C_1$ - $C_{18}$ -alkoxy,  $C_2$ - $C_{10}$ -alkenyl or  $C_3$ - $C_{15}$ -alkylalkenyl groups as substituents;
- $R^4$  is hydrogen or a  $C_1$ - $C_{20}$  group;
- $R^5, R^6$  are identical or different and are each hydrogen or a  $C_1$ - $C_{20}$  group.
7. (currently amended) A catalyst system comprising one or more compounds of the formula (I) as claimed in claim 1 ~~any of claims 1 to 3~~ and one or more



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cocatalysts and/or supports.

8. (currently amended) ~~The use of a~~ A process for preparing a polyolefin by polymerization of one or more olefins in the presence of the catalyst system as claimed in claim 7 for the preparation of a polyolefin, in particular a copolymer of various olefins.
9. (canceled)
10. (currently amended) The use process as claimed in claim 8 ~~or 9~~ for the preparation of wherein the polyolefin is an ethylene-propylene copolymers copolymer.
11. (currently amended) A process for preparing a polyolefin by polymerization of one or more olefins in the presence of one or more compounds of the formula (I) as claimed in claim 1 ~~any of claims 1 to 3~~.